Saskatchewan

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Agriculture Development Fund

FINAL REPORT

PRODUCT DEVELOPMENT AND PROCESS DEVELOPMENT OF WOOD CHIPS PRODUCT

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Funded by
The Agriculture Development Fund

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Prepared by: PAR INDUSTRIES

98000024

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ABSTRACT

Par Industries of Prince Albert, Sask. is a private company registered under the Non-Profit Corporation Act, whose aim and purpose is to create a viable, diversified, labour intensive industry, engaged in the employment of individuals who have employment difficulties. Par applied for ADF support to investigate the commercial use of wood chips, a widely available by-product created from the post and rail industry in northern Saskatchewan. Par wished to explore the market potential for compressed, packaged wood chips for the retail horticulture industry.

Because of the cost of shipping, combined with a low retail price, the market assessment was conducted in Saskatoon and Winnipeg, and confirmed with a buyer in California.

The findings were:

1. For the retail market, the main competitor is bark. Interviews with retailers showed that it would be very difficult for a wood chip product to compete with a bark product in the retail market place on both price and quality. Consumers want cedar or driftwood, clean, dry, uniform size, and with little interest in a colored product. If a colored product were produced, the color would need to be durable. There was no interest in a compressed product.
2. In the commercial market, such as landscapers there is a demand for wood chips in the form of mulch and bulk chip mulch. A dark color is required that will not gray over time, and is free of organic mineral or fines. Pine must be aged or colored. The material is sold in bulk rather than bags.

In summary there is a market for wood chips in bulk for the commercial trade. Par Industries is interested in creating manufacturing jobs in order to provide employment for their workers. With the commercial market sold in bulk rather than bags, the commercial market offers few opportunities for Par Industries.

Acknowledgement

Par Industries acknowledges the financial support of the Agricultural Diversification Fund in order to make this study possible.

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Executive Summary

Par Industries of Prince Albert is interested in exploring the market potential for compressed, packaged wood chips for use in the retail horticultural market.

The objective of Par Industries is to find market opportunities that provide jobs for their workers. Par believes that with the wide availability in northern Saskatchewan of wood chips created from the post and rail industry, that the opportunities to create a usable, value add product needs to be explored.

The objectives of the study were to:

1) Identify market demand and customer needs.
2) Develop the product specifications of packaged (compressed) wood chips.
3) Define the processing equipment requirements and modifications for compressed (baled) wood chips using peat moss baling (packaging) equipment.
4) Describe the operating parameters in a brief operating manual for employee training, safety, operational guidelines and general maintenance.

Following the Interim Report, and the fact that the retail market did not hold promise, the following questions were to be answered:

1) What is the commercial potential of wood chips?
2) What is the potential of this product in the American market?
3) What do larger retailers like Canadian Tire think of a product of this nature?
4) Does the product have to be compacted?

Findings

The initial review of the market opportunities in the retail, horticultural industry suggest that the market preference is for bark, preferably cedar or driftwood, packaged in 3 cubic feet plastic bags, clean, dry, of uniform size and with little interest in a colored product. However, if a colored product is produced, then color durability of at least three years is required. There was no interest at the retail level in a compressed product.

It was felt that the retail market offered few opportunities for Par Industries. Because of freight costs, weight considerations and price the market evaluation of the product was initially focused on the local market.

Once, it was determined that the retail market held little promise, the objectives of the study were changed by Par Industries. The following are the findings of the commercial and U.S. market:

There is interest from the commercial market such as landscapers for bulk wood chips in the form of mulch and bulk chip mulch sold in bulk. A dark color is required that will not grey over time, and is free of organic mineral or fines.

The California market was investigated, with the finding that the product will have difficulty being competitive into that market.

Although a market exists for bulk product, that is not what Par Industries was looking for. Par Industries is looking for a product that requires packaging, in order to employ its workers. For this reason, this market was not deemed suitable.

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Objectives of the Study

The original objectives of the study were to:
1) Identify market demand and customer needs.
2) Develop the product specifications of packaged (compressed) wood chips.
3) Define the processing equipment requirements and modification for compressed (baled) wood chips using peat moss style baling (packaging) equipment.
4) Describe the operating parameters in a brief operating manual for employee training, safety, operational guidelines and general maintenance.

Once it was determined, the retail horticultural market was not viable, the study was broadened to determine:
1) What is the commercial potential of wood chips?
2) What is the potential of this product in the American market?
3) What do the large retailers like Canadian Tire think of a product of this nature?
4) Does the product have to be compacted.

Technical Report

1) Executive Summary – See attached.
2) Report of the Consultant – See attached.

Par Industries worked with Mr. John Sher of SRC and hired Mr. Peter Kabatoff to investigate the quality of the raw material, to test the packaging of the product using various alternatives, to do dye tests and to test the product with an end user.

Par Industries had also done a lot of work exploring the type of equipment required in advance of the feasibility study being completed. Once it was learned that the market at this time appears limited to the bulk commercial market, we decided not to proceed further.

It should be pointed out that when the retail market was first viewed as not viable for Par Industries, the consultants were asked to expand the project scope in order to look at the commercial market.

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Personnel

Trimension Training & Consulting Group Inc. of Prince Albert and Saskatoon were hired to conduct the feasibility analysis.

The costs of the consultant are shown under Expense Statement.
Mr. Peter Kabatoff was hired for duties described above.

Equipment

Par Industries had done a great deal of work exploring the machinery and packaging concept of the product. Par also experimented with various colours of product, photos of which are attached. Par Industries also worked with SRC from Saskatoon on the chemical make-up of the product. The final costs of the required equipment were not finalized as the project was viewed as not feasible.

Project Developed Materials

The only project developed materials is the consultant's report which is attached.

Project Photos

Photographs are attached of the various commercial products that were developed.

Acknowledgement

The Executive Summary of the Consultant's report acknowledges the support of the Agricultural Diversification Fund.

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Gen. Mgr.

98000024

The Commercial Use of Wood Chips

Pai Industries

August 1998

THE Trimension™ GROUP

Final Report

Executive Summary

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1.0 Introduction

Par Industries of Prince Albert is investigating the commercial use of wood chips, a widely available by-product created from the post and rail industry. Currently, wood chips are either burned or stockpiled and both are an environmental hazard according to Saskatchewan Environment and Resource Management (SERM).

By creating a usable, value-add product, these wood chips will become an economic asset. Trimension Group was hired to explore the market potential for compressed, packaged wood chips for use in the horticultural industry.

An interim report was completed in June highlighting bark as the major competitor. Given the product specifications demanded by consumers, it was felt that the product had a doubtful chance in the retail market.

As a follow up to the interim report, Trimension Group considered the following questions:

1. What is the commercial potential of wood chips?
2. What is the potential of this product in the American market?
3. What do the large retailers like Canadian Tire think of a product of this nature?
4. Does the product need to be compacted?

2.0 Methodology

During the first phase of the project, Trimension Group conducted personal and telephone interviews to assess the market potential of the compressed, packaged wood chip product. Personal interviews were conducted with the following retailers:

- *Early's Farm & Garden Centre (Saskatoon)*
- *Dutch Grower's Garden Centre (Saskatoon)*
- *D.J. Paterson Landscaping (Winnipeg)*

In addition, personal and telephone interviews were held with a sales representative, a product specialist and the president of *Greenleaf Products Inc.*, a distributor.

During the second phase of the project, Trimension Group conducted personal and telephone interviews with the following companies:

- *Federated Co-operative (Saskatoon)*
- *KLA Group Landscape Architecture (Saskatoon)*
- *Canadian Tire (Saskatoon)*
- *Landscape Development Inc. (Valencia, California)*

- *PSD (Valencia, California)*

Several contractors, including *Wilco* in Ontario and *Wozniak & Son's* in Saskatoon, were also contacted for comment; however, due to the busy season, no feedback was obtained after several attempts. In addition, we visited the garden centres at *Peavey Mart* and *Revelstoke* in Saskatoon.

3.0 Key Findings

The main competitor in the retail market is bark; however, contractors and landscapers use wood chips for commercial ventures. The analysis is divided into two sections, the first describing the retail market and the second describing the commercial market.

3.1 Retail Market

Overall, the general sense is that it would be very difficult for a wood chip product to compete with a bark product in the retail marketplace. According to the retailers we spoke with, bark would remain the bigger market even with the introduction of a wood chip product. As Federated Co-operatives stated, "Overall, this is a very tough market to get into."

3.1.1 Product Quality

Consumers purchase bark products for decorative purposes. The consensus is that consumers desire pure bark and no wood. Specifically, D.J. Paterson Landscaping in Winnipeg advised that their customers want cedar or driftwood. They were quite adamant that their customers would not buy a product that is, in their words, a "hodge podge" of product or a mixture of bark and wood chips. They want product that has been sized and screened for "fines."

PSD in Valencia, California indicated that the product must be really clean and have nice ground cover. Overall, it must look good. Currently tree branches/wood are being sold as forest products, but PSD considers this type of product to be "garbage."

Given the fussy nature of consumers, some of the companies we spoke to suggest that they would not stock a wood chip product because it would not meet the required specifications. In fact, Greenleaf Products Inc., a distributor, advised that for the retail market, the products from the prairie provinces do not meet the market requirements. They advise that the product must be bark and preferably a thick bark of reasonably uniform size. Federated Co-operative also mentioned consistency as an important product feature. Overall, the results suggest that bark chunk is a hard product to compete with in the retail market.

At Canadian Tire, further evidence of the demanding product specifications of consumers was found. They revealed that bark nuggets are more popular than bark mulch because they have a decorative use.

Another concern expressed by retailers was that wood chips are usually heavy weight products. As such, bagging may be difficult because there is variability in weight due to moisture. We were told that wood chips would need to be dried first. This is particularly important because moisture leads to the potential for infestation. The product would likely need to be fumigated first to ensure that it is clear of bugs.

Primarily the bark sold in bags is bark chunk, with the consumer preference being for large chunks (70% of the market) over medium chunks (30% of the market). Bark is uniform, sized/screened and sold in a clear bag. It comes from BC or in some cases from Idaho, as there is only so much bark in Canada that meets the market requirements. Canadian Tire and Revelstoke both sell products from Greenleaf Products Inc.

3.1.2 Colored Product

Federated Co-operative suggested that if a wood chip product was dyed to look like cedar and was cheaper than bark, there might be a market for it. However, they did not see a use for a colored product by decorators. Furthermore, they revealed that there was a colored product from Calgary that was made from construction site scraps, but that it did not make it in the marketplace. This particular product sold for two times the price of regular product.

PSD in California indicated that they would not purchase a colored product because everything they sell is "all natural and the dye just disappears anyway." They told us that a lot of people are selling a dyed product that is dyed red and sold as redwood, but that the color fades.

Canadian Tire thought that if a colored product were offered, it would be most effective if it was included in a catalogue. Customers could then look at pictures of the product and order it in. They did indicate that customers currently do not ask for a colored product when purchasing landscaping materials.

3.1.3 Bag Size

Bark is sold in a 3.0 cubic foot bag (84.9 litres); however, mass merchandisers sell 2.0 cu. ft. bags to get their price point down. Canadian Tire and Revelstoke evidence this by selling 2.0 cubic feet bags of bark mulch and bark chunks. However, Federated Co-operative said that the preferred size for a wood chip product would be 3.0 cu. ft.

In the United States, the preferred bag size appears to be 2.0 cu. ft. When we spoke with PSD in California, they indicated that "everyone buys 2.0 cu. ft." However, the product is also sold in 3.0 cu. ft. and 5.0 cu. ft.

The soil mixes made of composted bark are bagged in 2.0 cu. ft. bags and the moisture content is from 50% to 60% in the bag.

The advantage of a wood chip product would be if a lot could be compressed into a big bale because a 3.0 cu. ft. bag does not spread over a lot of space. However, retailers thought that it might be difficult to compress wood chips. For specific points on compression, see Section 3.1.4.

3.1.4 Compression

Overall, it was felt that compression would not be a major selling point for a bagged, wood chip product. Currently everything is loose, including the California market. Furthermore, sales of loose Peat Moss are not suffering versus a compressed product. Generally, it was felt that a compressed product could not be much higher in price than a loose product.

As Federated Co-operative suggested, if compression was used, the market would need to be educated because compressed bark and wood chip products are not currently available. Also, a compressed product could not be too heavy or it would not sell. Water retention would be a concern because this would make the product heavier than usual. While Federated Co-operative is thinking of compressing wood shavings, this is a much lighter product overall.

3.1.5 Price

In terms of price, it would be important to keep freight costs for the wood chip product down in order to compete with bark. One retailer told us that the landed cost to the retailer for a wood chip product needs to be about $4.00 for a 3.0 cu. ft. bag and that traditionally freight costs limit a company to a 300 to 500 mile radius for shipping. Although Federated Co-operative currently ship their products to Calgary, it is cheaper to ship from Kalispell, Montana, where their product is currently coming from, than it would be to ship from Prince Albert. Also, they indicated that even if it cost 10 to 15 cents more per bag to ship from the United States, that would not be a big deal.

When we spoke to PSD in California, they expressed that everything is subject to price. Currently they purchase from Ohio and Louisiana, but they would consider buying Canadian if it was price competitive.

Currently, bagged bark is sold for about $4.99 to $7.99 for a 3.0 cu. ft. bag. In comparison, bulk wood chips sold by Dutch Growers are sold $20/half yard and no bagging is done. The following table shows the price of different bark products at various retailers:

Table 1: Comparison of Products and Pricing by Retailers

Company	Product(s)	Size	Price	Source
Early's	Cedar Mulch	2.0 cu. ft.	$5.99	Quebec
	Garden Bark	3.0 cu. ft.	$7.99	BC
Dutch Growers	Bark Chunk	3.0 cu. ft.	$7.95	BC & Idaho
	Bulk Wood Chips	half yard	$20.00	SK
Canadian Tire	Bark Mulch	2.0 cu. ft.	$3.99	Greenleaf -
	Medium Bark Nuggets	2.0 cu. ft.	$5.99	BC, AB, MB
Peavey Mart	Bark Chips	3.0 cu. ft.	$10.99	Idaho
Revelstoke	Bark Mulch	2.0 cu. ft.	N/A	Greenleaf -
	Large Bark Chunks	2.0 cu. ft.	$7.46	BC, AB, MB
PSD	Shredded Bark	cubic yard	$8.99 U.S.	Ohio &
	Chunk Bark	cubic yard	$11.29 U.S.	Louisiana

When visiting Canadian Tire, they suggested that a wood chip product would likely have to be priced in the retail market somewhere between their bark mulch and bark nuggets (approximately $4.99).

3.1.6 Quantity Sold

Dutch Growers receive three or four semi loads of wood chips per year at 150 yards each. However, currently at Dutch Growers the bagged market is the bigger market. People without a truck buy bagged product. They sell 3,000 3.0 cu. ft. bags of bark per year and receive 1,000 to a truckload. They are brought in on pallets and shrink wrapped.

With the exception of PSD in California, all of the other companies we contacted in the retail market sell bagged product only. Federated Co-operative sells approximately 20,000 bags of bark/wood chips per year. On the other hand, PSD gets in 110 cubic yards in a load, three to four times per week. This product comes from one supplier, depicting the type of volume they would be looking at sourcing. They have 25 acres and can stockpile product and then broker it out.

3.1.7 Equipment

Bark is harvested using a tumbler that minimizes the wood. It is then screened to size using a star-type screen. The large size bark is a "small fist" size, medium is 1.5 inches and then there is mulch. Composted bark is used in soil mixes and it takes a season to compost and stabilize the product.

On the other hand, peelers are used on posts (i.e. Vermettes) and this equipment results in longer, stringy pieces and a surplus of wood chips. According to Greenleaf Products Inc., this equipment will not satisfy the product specifications needed for this market.

3.1.8 Seasons

Bark is sold in the spring through the fall. Most of it is sold in spring and then fall, but some is still sold in the summer months.

3.2 Commercial Market

Wood chips are commonly used in commercial jobs, both within Saskatchewan and in California. In fact, Landscape Development Inc. in California said they use wood chips in every job.

3.2.1 Product Quality

While consumers purchase landscaping products for decorative purposes, the commercial market chooses product that has practical applications, is of good quality, and is affordable. The specifications for the job are outlined by the landscape architect, with KLA Group in Saskatoon promoting the use of mulches and products indigenous to Saskatchewan.

KLA Group has used mulch from Weyerhauser and bulk chip mulch from L & M Wood Products in Glaslyn, Saskatchewan. They find product from L & M to be the cleanest material. Having clean material is very important and takes precedence over the size. If some pieces are too big, the contractor simply cleans through it after it is placed.

In general, the product should not gray over time and if it has organic or mineral "fines" this can contaminate the product. As a rule, contractors will not usually use the bottom layer because of contamination.

While hotels, commercial buildings and production homes tend to use mulch, condominiums and model homes prefer a higher quality product. In fact, many condominiums do not like mulch and would rather do weeding than use it. In the United States, some bark is important (a combination of bark and wood chips) and the darker the color, the better. For example, pine must be aged or it is unacceptable, except in the case of playground bark.

3.2.2 Colored Product

Colored product is virtually unexplored in the commercial market, among the companies we spoke to. KLA Group said they would try a colored product once or twice, but if the color is gone in one year, this would be a problem. They were curious as to the life cycle due to sun exposure, but would expect to recycle the mulch every three years or so.

In California, Landscape Development knew of one vendor that does a colored product in orange, green, and other colors. Landscape Development does not use this product, but the individual we spoke with was unsure if it was due to the look of it or because of the cost. Apparently, the orange product is not natural looking at all.

In general, businesses want their grounds to stand out and may like a colored product for that reason. It would just need to be a color that contrasts to the planting. In BC and Alberta, colored product is used quite a bit. However, the life cycle of the product and its cost may affect the potential for a colored product.

3.2.3 Product Use

Landscape Development does not buy product in big quantities, but rather per job. The average might be approximately 80 yards per job. They tend to get their product from California and use loose product, which comes on a 40 yard truck. If they are in a bind, they will use a bagged product.

KLA Group uses 1,500 to 2,500 cubic metres of mulch per year and their product is brought in loose and then just dumped. They usually do not recommend a landscape fabric because if they have the proper depth (6 to 8 inches of mulch) they do not need it.

3.2.4 Markets

Significant markets for wood chips may include city parks and the restoration of nature areas. Other potential markets are condominiums and hog operations for use on lagoons.

3.2.5 Price

The cost for wood chips in the Saskatchewan market is $20 to $25 per cubic metre, while bark tends to be $40 and redwood fibre mulch is also quite pricey. A big chunk of the cost of these materials is freight, but the markup varies from contractor to contractor. Wozniak & Sons sell their post peelings for $28 per cubic yard for the natural product and $38 per cubic yard for the colored product, which comes in dark brown, light brown, red and cedar.

In California, backfill material is $7 to $8 U.S. per yard, while bark is $15 to $40 U.S. per yard. Overall, affordability and having the opportunity to approve a sample product are necessary before they would consider purchasing a Canadian product.

3.3 Conclusions

Based on the analysis, the following conclusions are made in response to the research questions.

3.3.1 What is the commercial potential of wood chips?

It appears as though there is potential for a wood chip product in the commercial market; however, the driving factors are price and quality. A clean product is very important, requiring the absence of "fines" that can contaminate the product. In California, color is critical, with a darker product being the preference. Specifically, pine that is not aged would be unacceptable. In general, a colored product is not highly demanded and the market for a colored product is questionable at best given the uncertainty of its life cycle, cost and appearance.

3.3.2 What is the potential of this product in the American market?

Price is the overriding factor in the decision process for American companies using wood chips. If the product is affordable, companies in California would be open to purchasing a Canadian product. It is also essential that the product meet certain quality expectations, including cleanliness and a good overall look and color.

3.3.3 What do the large retailers like Canadian Tire think of a product of this nature?

The large retailers feel that there may be some market potential for a wood chip product. However, they also indicate that the market for bark would likely remain the bigger market, because of its use for decorative purposes and its absence of "fines." Overall, the common finding is that it is a tough market to enter into and compete in.

3.3.4 Does the product need to be compacted?

Generally, compacting the wood chips was not considered a major selling point. There are currently no compacted products of this nature on the market, with the exception of peat moss. Furthermore, sales of loose peat moss are not thought to be suffering in comparison to compacted peat moss.

Several difficulties and few benefits of compacting wood chips were mentioned. Some of the potential difficulties include:

- Market is not educated
- Product might be too heavy
- Product could not be priced too much higher than a non-compacted product
- Water retention

Because compaction is not an issue in the marketplace, Trimension Group did not research equipment requirements and specifications for compacting wood chips.

4.0 Recommendations

If Par Industries were to consider entering the retail market, Table 2 shows the minimum and maximum price that Par Industries would need to produce the product at to make a profit. The analysis is based on the profit range of 18% to 25% desired by Par Industries and the landed price of $4.00 for a 3.0 cu. ft. bag quoted by a retailer in the Saskatoon market.

Table 2: Necessary Production Costs to Compete in the Retail Market

Profit Target	Production Cost Needed to Achieve Target (3.0 cu. ft. bag)
18%	$3.39
25%	$3.20

Table 2 reveals that to achieve a profit target of 18%, Par Industries would need to produce their product at a cost of $3.39, including transport costs and a mark-up on the product. These estimates are not based on a compacted product, as this would not be necessary for the retail market. This information provides the basis for Par Industries to make a decision regarding whether or not to establish this venture.

Overall, the retail market appears very competitive and is particular regarding its product requirements. Furthermore, retailers suggested that bark would still dominate the market if a wood chip product were offered. As a result, it is not recommended that Par Industries target the retail market at this time because evidence of success is not strong enough to proceed.

In the commercial market, sales of loose wood chips are a possibility; however price and quality are key. A clean product, free of "fines" is extremely important. Even if a product is high in quality, it must still be affordable in comparison to the other products available. Based on the information we obtained, the price in the Saskatchewan market is $20 to $25 per cubic metre[1], while in the U.S. the price is $7 to $8 U.S. per cubic yard[2]. If we translate the U.S. prices into Canadian dollars, it would be approximately $10.50 to $11.99 per cubic yard, based on an exchange rate of $1.4993 U.S. for one Canadian dollar. This indicates that the Saskatchewan market would have to become much more competitive than it currently is to compete in the American market for wood chips.

[1] 39 inches x 39 inches x 39 inches
[2] 36 inches x 36 inches x 36 inches

While the commercial market does hold some promise, particularly in Saskatchewan, the job creation associated with a bagged wood chip product would be lost, as it is not a labour intensive market. Therefore, it is questionable whether there would be any significant advantage to pursuing the commercial market, except perhaps in Prince Albert and surrounding area where Par Industries' employees could participate in spreading the mulch. In terms of the American market, it is unlikely that the Saskatchewan market could compete with current U.S. prices.

Lastly, the market potential for a colored wood chip product is uncertain and does not appear strong. The product is not demanded in the retail market and is not commonly used in the commercial market, except perhaps some use in BC and Alberta. It is not recommended that Par Industries focus on a colored wood chip product at this time. Further analysis would be necessary to determine the product's life cycle, as this is a major concern in the market.